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ABSTRACT

The World Wide Web offers significant opportunities for instruction--opening up education to the unserved or underserved, providing new tools to enhance learning and increasing convenience for learners in terms of effective use of place and time. Prior to planning for Web-based instruction, it is imperative that the underlying motivation is explored. Issues to address when planning and developing Web-based instruction include: (1) institutional commitment, including the co-involvement of institutional units and establishing personnel and technology resources; (2) a faculty reward structure; (3) instructional design and development; (4) student issues; (5) scheduling; (6) student management procedures; (7) student support; (8) learning issues and challenges; and (9) marketing. (AEF)

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

So You Want to Develop Web-based Instruction — Points to Ponder

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Web-based instruction (WBI) is at the cutting-edge (sometimes called bleeding-edge) of both today's technology and instructional design methodology. It offers significant opportunities — opening up education to the unserved or underserved, providing new tools to enhance learning, and increasing convenience for learners in terms of effective use of place and time.

But before beginning any discussion of WBI, it is imperative that the underlying motivation for beginning this discussion be explored. Instructional leaders must resolve the "Why do we want to do this?" issue before moving on. The answer will drive your response to many related issues. Possible answers to this key question include to:

- provide more convenient access to education.
- serve a previously unserved/underserved population.
- protect your share of the instructional market.
- expand your share of the instructional market.
- become a national leader in WBI.

Presuming that the institution successfully resolves the answer to the preceding complex question and decides to proceed with this project, we see the need for action focused on institutional commitment, instructional design and development, and student issues.

Institutional Commitment

Commitment is the place to begin. WBI must be intentional and purposeful. Campus-wide systematic planning is of the utmost importance to this endeavor. To successfully implement this type of a program, an institution should make a significant, long-term commitment concerning co-involvement of institutional units, resources, and faculty reward structure.

Co-involvement of Institutional Units

The institution must develop partnerships within its existing units because each possess the e.,ertise and resources that may never exist within individual co-operating units. The administration from the President on down must support this project, because without their support, the inter-unit partnerships that are required to enable program success may never develop. An institution-wide leader must be appointed who has not only the expertise to complete the project, but also the power to make it happen (Shore, 1997). Specific organizations that will greatly impact this process are the computer center, organic centers for instructional design and development, student services, and programs which contain content expertise.

Resources

Critical resources may be grouped into two general classes, personnel and technology. Personnel will be needed to develop and manage the WBI. Development requires specialized training and expertise which is slowly acquired. Initially only a handful of faculty and staff may have the necessary skill sets. Of course, outside hires or consultants are possible solutions, but this still requires resource commitment. The commitment doesn't stop once the WBI is developed, though. It continues throughout the life of the course, a much longer time than the development period.

One of the major resource areas that must be explored prior to beginning instructional development of web-based courses is the technology. Problems including service volume, compatibility, training, and technical support must be solved before one can begin to successfully develop web-based courses.

WBI, by design, will significantly increase the load on the institution's web distribution capability. Planning must be accomplished for this increased traffic to preclude total gridlock when students of WBI courses are trying to access information. Problems including incompatibility between

IR018816

student and instructional hardware and software systems and slow internet connections must be taken into consideration when developing web-based courses. Faculty and staff who are developing the courses need access to computers and software that are capable of handling the various tasks necessary to develop the multimedia elements required to support a web-based course. These elements include, but are not limited to video, sound, and graphics.

At the other end of the spectrum, students will need a system and software to display all the components of the courseware. Courses will need to be developed in such a way that they can be delivered regardless of what system is available to the student. The software necessary to run various parts of the courseware must be made available for the student to download either on- or off-site. Bandwidth also becomes a problem. An uncompressed one hour movie running at 30 fps at a resolution of 640x480 requires 100 GB to store. Time to transmit using a 28.8 kbps modem is 320 days (Fryer, 1997). These problems make hybrid designs (combinations of CD and WBI) attractive.

Another problem area is training in the capabilities and limitations of the web and its use by both the faculty who are developing the courses and the students who will be expected to take the courses. Most faculty do not possess the technical skills necessary to develop courses for delivery over the web. This is currently mitigated by the fact that instructors who are developing on-line courses at this time have some knowledge and interest in computers. Students will need to acquire the necessary skills to configure their system to run the WBI courses. Once the courseware is developed, hardware and software for distribution is necessary.

Technical support becomes critical as faculty with little or no technical training become involved in developing courses for delivery over the web. As this type of instruction becomes more commonplace, one can expect more involvement from faculty with less computer knowledge. "Those involved in on-line learning initiatives report that robust technical support is crucial to the success of courses." (ed tech, 1997)

Faculty Reward Structure

Faculty commitment to delivering a WBI-program is at the heart of any program's ultimate success or failure. They must feel that it is a valued enterprise through the existing reward structure, with significant credit toward promotion/tenure. Faculty productivity, as measured by usual standards, may be severely impacted, posing a risk, especially to non-tenured faculty and faculty below the rank of Professor.

It appears that in many institutions the faculty reward system fails to address critical issues associated with using technology for teaching and learning, and in some cases, actually seems to discourage innovation in technology-based instructional delivery through disincentives. Cummings (1995, 1996) refers to these as faculty resistance barriers, and notes that "when teachers express the belief that for them, implementing ET [educational technology] offers more risks than rewards, their resistance is easy to understand" (1995, p. 14). In considering the design and delivery of web-based courses, some of the key questions related to these issues include:

- Will all faculty be required to design and deliver web-based courses?
- What effect will this time and energy commitment have on promotion and tenure?
- How does the concept of course load change with the use of the web for instructional delivery?
- Will faculty be offered any rewards (monetary or otherwise) for course design and delivery?
- What kinds of training will faculty be given in terms of the technology utilized for WBI delivery?
- Will instructional design training also be provided or will the institution provide instructional designers to work with faculty?
- What other resources will be available to faculty as they work through this process?

In terms of traditional faculty rewards and incentives (additional monetary compensation, reduced course load, etc.) it is somewhat difficult to make general predictions about the relationship between these extrinsic motivators and faculty willingness to participate in the design and delivery of a web-based program. These are, however, internal issues that the institution itself has a high degree of control over and thus are issues that can and should be addressed from the beginning of the planning process. (Connick, 1996)

Instructional Design and Development

The key to success for any learning environment is the effectiveness of the instruction. WBI is presented in a format that differs significantly from traditional instruction. To maximize the learning opportunities for this presentation format requires a shift in pedagogy. WBI alters not only the method in which information is presented to the learner but also changes the way in which the learner interacts with information. The essence of this shift focuses on instruction within the constructivist paradigm. Rather than designing instruction that is intended to deliver information to the learner, it is necessary to design instruction which engages the learner in interactive activities (Sherry, 1995). Careful planning is required to establish that learning is a process in which the student actively participates.

The amount of time and effort that must go into the design and delivery for web-based courses should not be underestimated. Overviews of the major components of this process have been discussed by Odasz (1994) and in *Learning on the Web: An Instructor's Manual* <http://

teleeducation.nb.ca/lotw/>. Each facet requires specialized expertise to produce effective instruction. The initial phase of course design would include a team organized to conduct a needs analysis. Academic units need to determine if existing courses and course sequences are suited for on-line offering, if existing programs could be modified, or whether new programs are more appropriate. Content experts, instructional designers, end-users or practitioners, graphic designers, web page designers, program administrators, and university administrators all need to be included in various phases of the design process. The British Open University has been involved in distance education for over 30 years. Each course offered by BOU is designed by a team of experts which may include as many as 20 or more individuals (Moore and Kearsley, 1996).

Media should always be selected on the basis of the effectiveness of the medium to deliver the content. An initial planning decision involves the appropriateness of WBI for course content. The design team must determine that the instruction can be effectively delivered via computer capabilities. An analysis of course content must be conducted to determine course topics that require other or additional delivery methods. WBI tends to be heavily text dependent. There are many other media including audio, video, photographs, graphics, and charts that can be enlisted within the course design to ensure that the content is being effectively delivered. The design team must ensure that the instruction utilizes the most effective feature of on-line instruction — its interactivity and is not just a series of lectures, or written text.

Development of the courseware requires specialized expertise and time. Recognized industry standards are from 30 - 600 hours of development time for every new hour of instruction delivered (Golas, 1993). The wide variance is due to the mix of complexity of the subject matter and the type of media and method that is chosen. If we were to choose to teach a relatively low-level skill with some interactivity and utilize a multimedia environment, one may find that 100 hours development time per new hour of instruction may be required. Given that a three semester hour course has 45 contact hours, then the required development time may be 4500 hours — over two person years. The industry also recognizes that a startup project would require much more than the average figures and incurs a risk much higher than normal.

Student Issues

Even before development begins, administrators should decide how the course is to be managed — enrollment in cohort or on-demand. Once the course is developed, ongoing management is required. A faculty member or graduate assistant must be designated to assist and assess the students. Computing resources must be allocated sufficient for the enrollment. Tuition charges must be managed. Typically, tuition costs for these courses are significantly higher than normal courses because of the higher development and management costs. These charges can be potentially adjusted downward through competitive forces as more courses are offered.

As students and faculty must make significant adjustments in the way that they approach instruction in a web environment, so must the administration. In fact, administrators must be active in the development of any institution-wide move to WBI. Support for the development of the instruction must be available. Resources must be allocated for the development of the instruction. Examples may be:

- load adjustment to provide faculty course development time,
- staff direction to provide assistance in instructional design and development,
- administrative time to develop course management, and
- specialized applications for course development and web management.

Scheduling

One of the important decisions that must be made is the enrollment or scheduling model. Current models of scheduling for traditional students are the batch or course-based model. Students choose the course that they will enroll in based on degree requirements and accomplish the courses during a formalized periods that are designated semesters, quarters or terms. This scheduling model is appropriate regardless of the instructional model chosen — a course supplement model or a virtual classroom model. The course supplement model uses the WWW to augment conventionally delivered courses, while the virtual classroom model is one where all instructional aspects are delivered via the WWW and students and teachers may never meet in person (Saltzberg & Paxton, 1995). Non-traditional students may also be in degree programs and thus choose their courses based on program requirements, but a larger number of them are non-degree students who choose their courses based on personal perceived needs and time availability (Butler, 1997). Both traditional and non-traditional students may opt to erase the artificial boundaries created by batch scheduling. These types of students may prefer an open enrollment model that allows students to begin courses at any time and complete them as time is available.

Admission, advising, and registration procedures must also be addressed. These procedures are somewhat tied to the enrollment model. If scheduling using the open model, admission and advising should be flexible. Procedures may be developed to accommodate enrollment, advising, and scheduling via the WWW. Batch scheduling can also take advantage of the convenience afforded by accomplishment via the WWW, however, because it is quite traditional, this method need not be used.

Student Management

Student management procedures must also be developed. Entirely web-based courses may struggle with security because the student is unknown. Admission requirements must include screening strategies to identify the students. Ascertaining who is accomplishing the work is problematic. As students engage in the learning process, additional measures must be devised to identify the students as they proceed through various course activities. The outcomes of a program are dependent on the student demonstrating specific skills or knowledge as a result of the instruction. Without a method of determining student identity, the integrity of the program is in jeopardy.

Transfer policies must be developed. Because convenience and appropriateness for the learner's needs receive a high priority in these situations, the learner may not be persistent in programs. They may "shop" for the best or most convenient course and look at transfer as a means of eventually consolidating courses into a program. Another problem may be how to handle the occasional "convenience course" that is taken to replace a course in a traditional program. How should the course content and administration be verified?

Another student management issue is evaluation. Even if the security issue is ignored, keeping track of the participation and assignments for a web-based course is a challenge. When there are many students enrolled at different sites, the scoring, recording, and providing feedback can be a daunting task for the instructor. There are courseware such as Asymetrix's *Librarian* that can assist in the record-keeping, but the workload potential still remains. If the open enrollment model is used, there must be an instructor to provide services to the student, regardless of the number currently taking a "course." This may make student to instructor ratios extremely variable.

Student Support

Threlkeld and Brzoska (1994) categorize student support in two ways. The first category is non-content related institutional support, consisting of services such as admissions, registration, financial aid, counseling, and technology assistance. Typically, on-campus support services are available through a variety of offices, providing individual counseling, small group sessions, and written materials to help support the needs of learners. In a web-based learning situation, a distance learning coordinator or facilitator may perform some of these functions, and serve as a student resource person. (Sherry, 1995) The Education Network of Maine Online web site <http://www.emn.maine.edu/> is a good example of both the range of support services available to distance learners, and an effective way of communicating the availability of the services. The second category contains two areas of academic support. The first subsection includes support from faculty, which may include services such as expanded office hours, e-mail contact, and extended syllabi. The second subsection of academic support comes from classmates, and may include provisions for small group work and listservs. One category of academic support services may be added to Threlkeld and Brzoska's list: support to help students learn to become better learners. Students may need assistance in study skills and bibliographic (or library skills) instruction. These foundational support skills may make the difference between success and failure, especially in a situation where students may be highly motivated but lack experience in web-based learning.

Learning Issues

One of the barriers students may face when considering distance learning opportunities is lack of experience and expertise with a range of rapidly changing technologies. It is very easy for an instructor to tell a student to "Sign on to the listserv and participate in the group discussion. Then e-mail me your assignment in ASCII format" without even considering the possibility that a student may not have the expertise to accomplish these basic tasks. Adequate, on-going support *must* be provided to help students overcome their anxieties about the technologies used for distance learning—students should be spending time on course content, not worrying about how to attach a document to an e-mail message. Access to on-campus technology support personnel should also be available for more challenging problems.

Students who are successful in a distance learning environment tend to be mature, highly motivated, and possess well developed self-directed learning skills. At the same time, Moore and Kearsley (1996, p. 155) suggest that "Most adult learners also experience a considerable degree of anxiety about learning… There is a considerable fear of failure." Given this, it is important that students who lack essential learning skills or who are have a high degree of anxiety about web-based learning be given opportunities to master the necessary skills and overcome their anxiety. While maturity and motivation cannot be directly taught, they can be indirectly fostered as a result of the development of self-directed learning skills. Even experienced students face challenges in a new kind of learning environment and they may find that skills that served them well in a traditional classroom are inadequate for learning via the World Wide Web.

Marketing

Finally, marketing issues have to be addressed. Where are the students going to come from? What are their interests? Why should they take your courses? As more and more institutions offer WBI programs, one needs to determine what would attract the student (consumer) to a small institution when a big name institution offers the same program. The program must then direct their efforts

toward filling that perceived need. Accreditation is important in this instance (edTech, 1997).

Conclusion

WBI offers significant opportunities for institutions to open up education to the unserved or underserved, provide new tools to enhance learning, and increase convenience for learners in terms of effective use of place and time. The institution must make a commitment and systematically plan to implement this new form of instruction and faculty should also be aware of the additional time and effort that will be required to ensure the success of these initiatives.

References

Butler, B. S. (1997, 21 November). Continuous education: A model for WWW based education. [On-line]. Available: http://www.umac.edu/isc/cmc96/papers/butler-p.html.

Connick, G. P. (1996). *Planning for distance education projects*. Portland, ME: Distance Education Publications.

Cummings, L.E. (1995, Autumn). Educational technology-a faculty resistance view. Part I: Incentives and understanding. *Educational Technology Review*, 4, 13-18.

Cummings, L. E. (1996, Winter). Educational technology-a faculty resistance view. Part II: Challenges of resources, technology and tradition. *Educational Technology Review*, 5, 18-20, 30.

ed tech. (1997, 21 November). Discussion: How on-line course are developed. [On-line]. Available: http://www.tc.columbia.edu/~academic/edtech/revhome/discuss.htm

Fryer, B. (1997, November). Better WBT: Beating the traffic jam. *Inside Technology Training*, 28-31.

Golas, K. C. (1993). Estimating time to develop interactive courseware in the 1990's. Proceedings of the 15th Interservice/Industry Training Systems Conference (1993). Orlando FL: American Defense Preparedness Association.

Moore, M. G. & Kearsley, G. (1996). Distance education: A systems view. Wadsworth Publishing Company, Belmont, CA.

Odasz, F. (1994). Online teaching: A significant new pedagogy, the community as a K-100 university. *edJournal*, 8(1), 31-34.

Saltzberg, S. & Polyson, S. (1995, September). Distributed learning on the world wide web. *Syllabus*.

Sherry, L.C. (1995). Issues in distance learning. *International Journal of Educational Telecommunications*, 1, 337-365.

Shore, A. (1997, February). Technology integration in higher education: Planning for change. Paper presented at the National Convention of the Association for Educational Communications & Technology, Albuquerque, NM.

Threlkeld, R., & Brzoska, K. (1994). Research in distance education. In B. Willis (Ed.), *Distance education: Strategies and tools* (pp. 41-66). Englewood Cliffs, NJ: Educational Technology Publications.

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